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ABSTRACT

This curriculum guide was developed for use with public television's Nature series. The materials in the guide are designed to help students actively participate in the study and experience of nature. Students are encouraged to view the programs as naturalists would, observing animals in a variety of habitats, noting their behavior, and drawing conclusions. Each lesson in the Teacher's Resource Guide includes: (1) a "Program Overview" that presents background information and brief synopses of the program to be viewed; (2) "Objectives" that provide the teacher with measurement goals; (3) a "Before Viewing Activity" that familiarizes students with the subject and allows them to set purposes for viewing; (4) "Vocabulary" that features definitions of unfamiliar words used in each program; (5) "Discussion Questions" that help students assess the main points of the program; (6) "Suggested Resources" for students who may want to learn more about the topic; and (7) a "Naturalist's Guide" (student worksheet) to be duplicated and distributed to students. The programs highlighted in this guide focus on the vast Indian subcontinent and its rivers, oceans, deserts, mountains, and forests. Program titles include "The Tiger's Domain," "Sacred Waters," "Unknown Seas," "Desert Seas," "Desert Kingdom," "Mountains of the Gods," and "Monsoon Forests". (WRM)

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NATURE is made possible in part by Park Foundation. Major corporate support is provided by Canon U.S.A., Inc., Ford Motor Company, and TIAA-CREF. Additional support is provided by the nation's public television stations.

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Dear Friends of NATURE:

Park Foundation is dedicated to education and quality television. Similarly, concern for the environment ranks as a high priority. It is for these reasons that we are delighted to sponsor NATURE, the series that offers educators an opportunity to bring young people to remote and beautiful places, where they can enjoy and come to value the world's rich variety of animal and plant life.

This season's education package offers lessons, activities, and research projects to accompany the NATURE miniseries "India: Land of the Tiger." Our goal is to heighten your students' appreciation and understanding of the diverse wildlife, their habitats, and their interrelationships with the people of the Indian subcontinent through this important series.

We hope you find these materials useful in your efforts to introduce young people to the power and beauty of the natural world. Please know we are grateful for your work and are pleased to help support it.

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Dear Educator:

Canon U.S.A., Inc.
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Lake Success, N.Y. 11042-1113

For the ninth consecutive year Canon U.S.A., Inc. is pleased to be a sponsor of the NATURE series, and bring you this Teacher's Guide.

NATURE brings the wonders of the natural world into our homes in a unique and informative manner. The NATURE miniseries featured in this Guide – "India: Land of the Tiger" – will give you and your students new insights into the fascinating creatures of India, and some of the challenges facing the people who want to preserve them.

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We hope this Teacher's Guide will provide you with tools to enhance your teaching of the world around us. We salute your efforts and deeply respect your commitment to building "future generations." We are honored to play a part in providing you with materials you may wish to use in preparing your children to better understand NATURE.

Sincerely,
Haruo Murase

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Alex Trotman
Chairman of the Board

Ford Motor Company

Ford Motor Company
The American Road
P.O. Box 1899
Dearborn, MI 48121-1899

Dear Educator:

For the fifth consecutive year, the men and women of Ford Motor Company are proud to bring you this Teacher's Guide for NATURE.

This educational series, with its emphasis on wildlife, its habitats and their preservation, as well as the concerns of naturalists, parallels our efforts to protect the environment and be a responsible automotive company. Our employees have a vision to provide more people in more places with products that will not only raise our standard of living, but will also raise the banner of environmental stewardship.

This year's Guide features the six-part series, "India: Land of the Tiger." The Guide will help young people become more aware of India's animals and their habitats. It discusses how the people of the Indian subcontinent coexist with wildlife, and also provides students with suggestions on how to get involved with local conservation efforts.

Ford and the more than 350,000 employees who comprise its global team hope you find these materials useful in making the most of NATURE and increasing the environmental awareness of our youth.

Alex Trotman

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TIAA CREF

John H. Biggs
Chairman, President and CEO

Dear Educator,

TIAA-CREF is delighted to be a national sponsor of NATURE, and to help bring its valuable learning insights and teaching materials to you and your students.

We hope you find this Teacher's Guide useful as you and your students study NATURE's exciting six-part series, "India: Land of the Tiger."

For over eighty years, TIAA-CREF has recognized the crucial role of the teacher in our society. We are dedicated to providing pension, investment, and insurance products that help build financial security for those who choose careers in education and research.

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BYCRAIG SINCLAIR

Host: Valmik Thapar

INTRODUCTION

INDIA IS A LAND OF EXTRAORDINARY DIVERSITY.

From the Himalayas in the north, to the coral reefs off the southern coast, to the monsoon forests in the west and northeast, a visit to India is, in the words of naturalist Valmik Thapar, "the journey of a lifetime." This Teacher's Guide has been developed for use with public television's NATURE miniseries, "India: Land of the Tiger." Mr. Thapar, host of the series, explores the ecosystems of the vast Indian subcontinent – its rivers, oceans, deserts, mountains, and forests. "India: Land of the Tiger" also discusses the complex bonds between the varied wildlife of the region and the people.

We recommend that you preview "India: Land of the Tiger" to find the segments you'd like to focus on in class. Some of the programs include explicit scenes of animal mating, so you should preview "India: Land of the Tiger" carefully before showing it to your students.

THE EDUCATIONAL MATERIALS

This guide has been designed to help teachers and students use the public television series as a starting point for active participation in the study of nature. Students are encouraged to view the programs as a naturalist would, observing animals in a variety of habitats, noting their behavior, and drawing conclusions.

Each lesson in the Teacher's Guide includes:

✔ **Program Overview,** which gives background information and a brief synopsis of the program to be viewed;

✔ **Objectives,** which provide the teacher with measurable goals;

✔ **Before Viewing Activity,** familiarizing students with the subject and allowing them to set purposes for viewing;

✔ **Vocabulary,** which provides definitions of unfamiliar words used in each program;

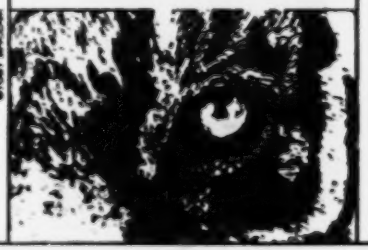
✔ **Discussion Questions** that help students assess the main points of the program;

✔ **Suggested Resources** for students who may want to learn more about the topic; and

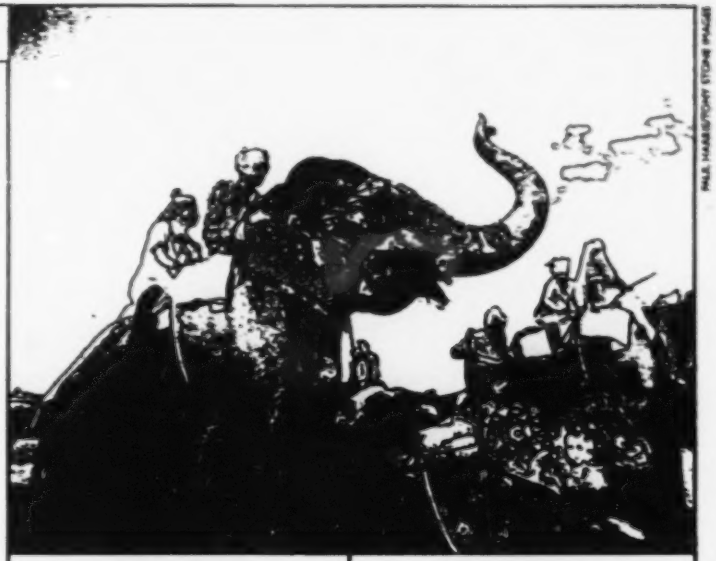
✔ **Student Worksheet** (Naturalist's Guide), to be duplicated and distributed to students. This student worksheet contains activities that will help students gain a better understanding of animal behavior, natural phenomena, and other subjects discussed in "India: Land of the Tiger." The student worksheets encourage family viewing and contain cooperative learning activities.

Creating a Naturalist's Diary
(You may wish to share the following with your students):

Naturalists keep diaries to record their observations. In order to complete activities presented in this guide, students may be interested in making diaries of their own. Students may set aside part of their science notebook, or they may choose to make a separate booklet for this purpose. Diaries may include news clippings, drawings, photos, maps, charts, graphs, and other information, as well as records of observations. Students may wish to share their diaries with others or use their entries to develop a bulletin board display that reflects what they have learned.



BYCRAIG SINCLAIR



PAUL HARRIS/STONE IMAGES

PROGRAM SCHEDULING

Programs are scheduled to be broadcast on the dates indicated below. Broadcast dates, however, may vary slightly from area to area. Please check local listings for any scheduling changes.

THE TIGER'S DOMAIN	*NOV. 15*
SACRED WATERS	*NOV. 15*
UNKNOWN SEAS	*NOV. 16*
DESERT KINGDOM	*NOV. 16*
MOUNTAINS OF THE GODS	*NOV. 17*
MONSOON FORESTS	*NOV. 17*

WEB SITES & WNETSCHOOL

Look for more information about NATURE on the Web at **www.pbs.org** or at **www.wnet.org.** These and related lessons can be found on wNetSchool **(www.wnet.org/wnetschool).**

VIDEOTAPING RIGHTS

You may assign programs to your students for viewing when they are first broadcast, or you have the right to tape the programs and play them for instructional purposes for one year after the original broadcast.

INTRODUCTION	*1*
THE TIGER'S DOMAIN	*2*
SACRED WATERS	*4*
UNKNOWN SEAS	*6*
DESERT KINGDOM	*8*
MOUNTAINS OF THE GODS	*10*
MONSOON FORESTS	*12*
NATURE SCHEDULE	*BACK COVER*
VIDEO ORDERING INFORMATION	*BACK COVER*

1 INDIA: LAND OF THE TIGER/THE TIGER'S DOMAIN

Broadcast Date: November 13, 1998

PROGRAM OVERVIEW

Valmik Thapar, an Indian conservationist and host of this six-part series, believes that no animal symbolizes the wildlife of India more than the tiger. "The sheer beauty and power of this magnificent creature has completely mesmerized me," says Thapar.

"The Tiger's Domain" follows Thapar as he travels through remote India, searching for wild tigers and many of the other animals celebrated in Rudyard Kipling's classic tales in *The Jungle Book*. On the first leg of his journey, he explores diverse habitats and encounters tigers, Asiatic lions, wild buffalo, rhinos, elephants, peacocks, cobras, and langur monkeys.

In his quest for interesting wildlife, Thapar travels thousands of miles, from the frozen peaks of the Himalayas to the sun-scorched deserts of Rajasthan. He also ventures into the green, humid forests of Assam and the warm, blue waters of the Indian Ocean.

"The Tiger's Domain" presents rare footage of various Indian animals hunting their prey. In one sequence, Thapar watches a tiger killing a langur monkey. Tigers rely on surprise to catch their prey, and, in fact, only one hunt in twenty succeeds.

Many of the nearly one billion people that live in India believe that some animals are sacred and should never be killed under any circumstances. As a result, wildlife is integrally woven into their daily lives.

Today, tigers are becoming endangered due to poaching and disappearing habitats. To learn how we might help protect tigers, scientists are using radio collars to track these creatures' territories, feeding habits, and social behavior.

***THEME:* Indian tigers live in a complex ecosystem with other animals and humans.**

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BEFORE VIEWING THE PROGRAM

Introducing the Program

To help students understand India's vastness, use a large world map or globe. Point out that all of the countries in Western Europe could easily fit inside the Indian subcontinent. Invite students to see this for themselves. Then, ask students to compare the size of the United States with India. Encourage students to make predictions about the climate (or climates) that exist in India.

To give students a sense of India's large population, explain that almost a billion people live there. You could mention that if a billion people were to join hands in a long line, they would stretch around the earth 25 times!

Many students are familiar with the Disney film *The Jungle Book*, or the book by Rudyard Kipling that it is based on. Review with your students the key characters, including Mowgli (the boy), Baloo (bear), Bagheera (panther), Shere Khan (tiger), and Kaa (snake). Remind your students that these stories reflect an English/American view of these animals and not necessarily that of Indian culture.

After viewing the program, you may ask students to read stories from *The Jungle Book*. How do Kipling's portrayals of animals compare to the real ones in "India: Land of the Tiger"?

Distribute the Student Worksheet (Naturalist's Guide)

Duplicate and distribute the Student Worksheet (Naturalist's Guide – opposite page) and the map of the Indian subcontinent printed on the back of the poster. Preview them with your students. As they watch the program, suggest they refer to the map. In addition, ask them to determine how animals are suited to live in certain habitats.

AFTER VIEWING THE PROGRAM

Encourage students to discuss the program and share their observations. The following questions may be used to spark discussion.

(L) Describe some methods animals in India use to obtain food, feed their young, and help each other survive. (Wild boars are sometimes able to steal food that other animals have caught. A tigress will eat the kill herself and feed her cubs milk until they are ready to eat meat. Langur monkeys, when they climb fruit trees, often accidentally dislodge loose fruit, which chital (spotted deer) can eat. Both creatures help warn each other of danger. If either detects a prowling tiger, it warns the entire forest.)

(L) As a result of farming and urban development, wolves in India have been hunted nearly to extinction. This is a problem the U.S. has faced. How are we dealing with this? Could our solution also work for India? (Answers will vary. The U.S. now has laws restricting the hunting of wolves. In some wild areas, we are now reintroducing certain species of wolves.)

Students will:

- examine how people coexist with animals in India
- discuss some ways to protect and conserve wildlife in their own communities

You may wish to introduce students to the vocabulary before viewing the program.

Buddhism noun: a religion originating in India, based on the teachings of Gautama Buddha that one can be liberated from life's suffering by self-purification

consecration noun: the protection of natural resources, such as wildlife and forests

Hinduism noun: the dominant religion of India, which emphasizes an individual's duty to fulfill custom and divine law (dharma). Hindu mythology includes some animal gods.

Kipling, Rudyard: (1865-1936) English writer, born in India. Author of **The Jungle Book** (1894).

predator noun: an animal that hunts other animals for food

prey noun: an animal that is hunted by a predator for food

radio collar noun: a special collar that emits sound waves, enabling scientists to keep track of an animal's territory, feeding habits, and social behavior

venom noun: poison produced by snakes, spiders, and scorpions for catching prey

For students who want to learn more about this topic, suggest the following:

Kipling, Rudyard. **The Jungle Book**. New York: William Morrow, 1995 (originally published 1894).

Thapar, Valmik. **Land of the Tiger: A Natural History of the Indian Subcontinent**. Berkeley: University of California Press, 1997.

The Tiger Information Center
http://www.5tigers.org

U.S. Fish & Wildlife Service - Endangered Species Home Page
http://www.fws.gov/r9endspp/endspp.html

Rare Earth Explorations
http://www.wildindia.com

WILDLIFE IN YOUR WORLD

Valmik Thapar enjoys observing animals and studying their behavior. In this program, he finds an Asiatic lion, a sloth bear, a snow leopard, and many other creatures. Use the chart to write down four animals you've seen in the last month, where you saw them, and what they were doing. Compare your chart with another student's.

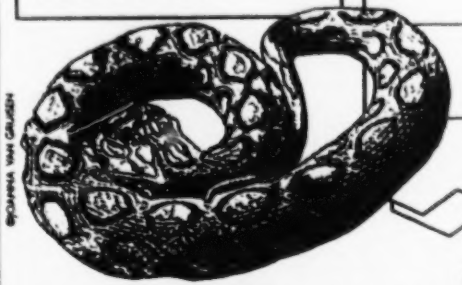
Complete the first activity and one other activity of your choice.

ANIMAL	WHERE I OBSERVED IT	WHAT IT WAS DOING
Example: ROBIN	Outside my window	Gathering material for a nest

TO THE FAMILY

You are invited to view NATURE. As you watch the program, look for the fascinating variety of animals in India. Why are there so many kinds of animals in India? How are attitudes towards animals different in India as compared to the United States? After the program, discuss your comparisons with your family.

A conservationist's job includes studying endangered species and working to prevent their extinction.



BOJANA VAN GRUSEN

GOING, GOING, GONE?

Valmik Thapar says, "We must save the tiger so that future generations can witness wonders like this." If you were the Prime Minister of India today, what actions would you take to protect nature in that country? How would you promote these ideas to India's citizens? Work with a small group of students to develop suggestions for a nature management plan in India.

Many animals in the United States are also in danger of becoming extinct. Get a list of these animals by writing to the U.S. Fish & Wildlife Service or from their Endangered Species Home Page (**http://www.fws.gov/r9endspp/endspp.html**). Pick one of them and find out where it lives, what it eats, and why it's endangered. Are there any efforts to save it? How could you and other students help?

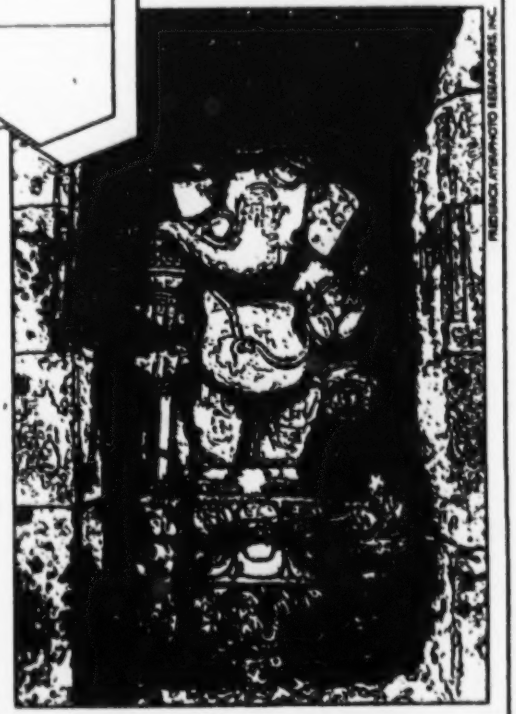
TH DAVIS/DAY STONE IMAGES

STUDY SCOLAR

12 DAYS, 12 NIGHTS & 200 ELEPHANTS

Animals are sacred to many people in India and Sri Lanka. Some religious festivals include processions called peraheras – parades and celebrations that can go on for days and sometimes include hundreds of elephants. Use the Internet or your library to find out more about peraheras. Write a short TV news segment about one of these processions for your classroom.

Animals also have a role in the Christian tradition. Search the Internet, or use other library resources to find out about the Feast of St. Francis of Assisi's Blessing of the Animals.



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2 INDIA: LAND OF THE TIGER/SACRED WATERS

Broadcast Date: November 15, 1998

PROGRAM OVERVIEW

Valmik Thapar shows us the wildlife along two of India's sacred rivers, the Ganges and the Brahmaputra. These rivers run through a wide variety of habitats where he encounters fascinating animals.

Two places in India where tigers flourish are Kaziranga National Park and the Sunderbans. Kaziranga is home to the highest density of tigers in the world and is a refuge for India's largest animals, including elephants and rhinos. Eighty years ago, there were only twelve rhinos left in this area, as poachers had decimated the population. But today, thanks to conservation efforts, there are over 1,200 rhinos. The Sunderbans, in contrast, is an enormous mangrove swamp where more than 500 tigers live.

Four hundred million people live on the plains of northern India and Bangladesh. Though it is difficult enough to support the large human population, people provide for local wildlife. Many children collect snails to feed colonies of young painted storks that have been abandoned.

Every year, in August, the monsoon season arrives in full force. At times, the rivers carry nearly a billion gallons of water to the sea every second. The floods kill hundreds of people each year, but leave behind rich silt, which creates a fertile environment for wildlife. During monsoon season, tens of thousands of birds flock to Bharatpur, one of the finest wedand sanctuaries in the world.

THEME: "Sacred Waters" illustrates how India's rivers influence both its wildlife and its people.

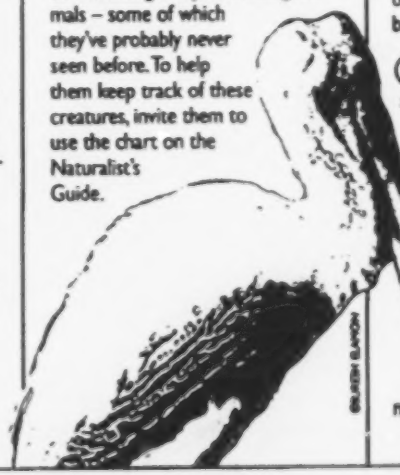
BEFORE VIEWING THE PROGRAM

Introducing the Program

Using a large map or globe, ask students to find the Ganges and Brahmaputra rivers in India. Invite them to compare these rivers with the Mississippi River, in terms of length, total flow, number of tributaries, and so on. If you wish, you can explain that, like the Mississippi, the rivers in India flood each year. Based on the location of the Ganges and Brahmaputra, encourage students to make predictions about the animals they might expect to find in these areas. What creatures thrive in or near water? Write these suggestions on the board.

Distribute the Student Worksheet (Naturalist's Guide)

Duplicate and distribute the Student Worksheet (Naturalist's Guide – opposite page) to students, and preview it with them. As they watch the program, tell students they will be observing many interesting animals – some of which they've probably never seen before. To help them keep track of these creatures, invite them to use the chart on the Naturalist's Guide.



Students will:

- understand how the great rivers of the Indian subcontinent influence the wildlife and people in these habitats
- compare and contrast different ways that animals in India raise their young

You may wish to introduce students to the vocabulary before viewing the program.

habitat noun: the natural place where a plant or animal lives.

mangrove noun: a tropical tree or shrub that grows in dense groupings with stilt-like roots.

migrate verb: to move annually or seasonally from one location to another for food; to go where the weather is warmer; or to reach breeding or "birthing" areas.

monsoon noun: strong, seasonal winds, especially in the Indian Ocean and Southeast Asia; in India, the word monsoon is generally applied to the heavy rains that fall between June and September.

poacher noun: someone who hunts or fishes illegally.

sanctuary noun: a natural area where birds or other animals are protected from hunters.

For students who want to learn more about this topic, suggest the following:

Books

Cumming, David. The Ganges Delta and its People. New York: Thomson Learning, 1994.

Lavies, Bianca. Mangrove Wilderness: Nature's Nursery. New York: E. P. Dutton, 1994.

Internet Links

International Rhino Foundation - Indian Rhinoceros
http://www.rhinos-irf.org/rhinos/indian.html

History of India
http://www.historyofindia.com/home.html

AFTER VIEWING THE PROGRAM

Encourage students to discuss the program and share their observations. The following questions may be used to spark discussion.

1. How are some animals adapted for survival on land and in the waters of India?
(Fishing cats' claws, which look like fish hooks, help them snag their prey in the water. Mudskippers have the ability to walk on land when the tides recede. Water monitors live on land but also can swim. Monkeys called macaques survive by searching for food both in the trees and on the mud near the shoreline.)

2. Describe the unusual wetland sanctuary of Bharatpur.
(This wetland is artificial. It was created about one hundred years ago by the Maharajah of Bharatpur. He flooded the natural marshland to attract birds for shooting. Today, shooting is forbidden, and thousands of birds breed here during the monsoon season.)

3. What are some of the ways that people manage their relationships to animals in and around the rivers of India?
(The tiger is a sacred animal. People fear and respect the tigers that live in the mangroves, and do not intrude on their domain. Fishermen use otters to find fish. In exchange, the fishermen give the otters scraps from their daily catch.)

MUDSKIPPERS AND MORE

Many unusual creatures live in or near India's rivers. Since these rivers flood every year during monsoon season, some of these animals have adapted to life on the land and in water. As you watch the program, look and listen for information about the five animals listed here. You will probably need to do some additional research to fill in all the information.

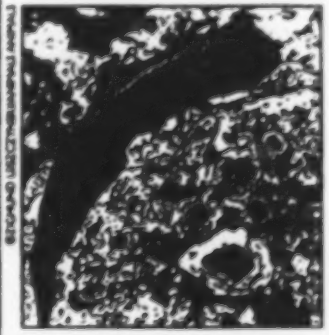
Complete the first activity and one other activity of your choice.

ANIMAL	HABITAT	PREY	ADAPTATIONS	NOTES
mudskipper	mangroves		can swim and walk	
gharial		fish	thin jaws to grab prey	
fishing cat				
painted stork				
otter				

TO THE FAMILY

You are invited to view NATURE. As you watch the program, look for some of the ways that children interact with the local creatures. Often these children are helping their family's livelihood. After the program, discuss what it might be like to grow up in India.

Some naturalists explore the diverse wildlife that thrives near large bodies of water.

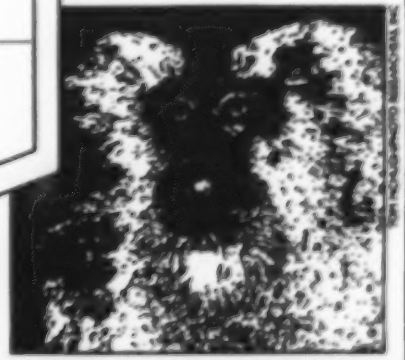


FOR THE BIRDS

In this program, Valmik Thapar says, "If I were a bird, I would dive into Bharatpur to live and stay." This part of India is home to thousands of different kinds of birds. Using the Internet and other resources in your library, find an example of a wildlife sanctuary in your area. Call, write, or e-mail the sanctuary to gather information about the animals that live there. Share what you learn with the class.

THE BUDDY SYSTEM

Some animals have a helpful relationship with each other. In the forests of northern India, the macaque monkey and chital deer help each other look out for danger. Biologists call this cooperative behavior symbiosis, or mutualism. Research other animal pairs in nature, both in India and elsewhere, that help each other out. (Some suggestions: the clown fish and the sea anemone; the remora and the shark; the rhino and the oxpecker.)



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3 INDIA: LAND OF THE TIGER/UNKNOWN SEAS

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Broadcast Date: November 16, 1998

PROGRAM OVERVIEW

In this program, Valmik Thapar embarks on a voyage to the warm, blue waters of the Indian Ocean, in search of living treasures. He sets sail off the northwest coast of India near the Arabian Sea. Following the wind and water currents around the southern tip of India, he next explores the isles of the Andaman Sea. The last leg of his adventure takes him to the east coast, near the Bay of Bengal.

While traveling in the Arabian Sea, Thapar explains that two of the largest creatures there – the whale shark and the manta ray – are harmless to humans, feeding on tiny plankton. Thapar then explores a cluster of coral reefs and islands called the Lakshadweep, nearly 200 miles off the west coast of India.

In the tropical Andaman Sea, the climate is perfect for the growth of coral reefs. These provide sustenance for many small fish, and feasts for predators such as sharks, rays, and tuna. More than 600 miles from the mainland, Thapar explores a chain of over 300 islands that were once part of a mountain range in southeast Asia. In this region, Thapar also observes a group of "working elephants," swimming between the islands to haul timber for people.

THEME: "Unknown Seas" demonstrates how creatures in the waters surrounding the Indian subcontinent have adapted to their environments.

BEFORE VIEWING THE PROGRAM

Introducing the Program

As students view "Unknown Seas," they'll discover that appearances can sometimes be deceptive. Ask students to look at a photograph of the whale shark. Explain that this rare sea creature lives in the Indian Ocean and can grow as large as six elephants. Ask the class to predict what this species eats. Record all hypotheses on the board.

Some students may guess that whale sharks eat other fish. Explain that they usually eat plankton. Discuss how the whale shark ingests huge amounts of water, filters out the plankton, and pushes the water out of its gills. To emphasize the importance of large marine animals, ask how the ocean would be different without big sharks and whales. Why is it important to protect them?

In this program, distances and sizes are described in metric units. Explain that if you know a distance in kilometers, you can find out the equivalent number of miles by multiplying by .62; similarly, if you know the length in meters, you can figure out the number of feet by multiplying by 3.28. (As an example, students could calculate how many feet long a fifteen-meter whale shark is.)

Distribute the Student Worksheet (Naturalist's Guide)

Duplicate and distribute the Student Worksheet (Naturalist's Guide – opposite page) to students, and preview it with them. As they watch the program, encourage students to observe the coral reefs and the animals that live there. Explain that, as a class project, you will be creating a large mural of a coral reef. They should sketch pictures of underwater wildlife they want to include.

AFTER VIEWING THE PROGRAM

Encourage students to discuss the program and share their observations. The following questions may be used to spark discussion.

WHALE SHARK

©BBC NATURAL HISTORY PHOTOGRAPHER: KEN MACKAY/BBC NHU

1 **Many of the fish that live in coral reefs are brightly colored. What are some benefits of this?** (Coral fish graze on algae and are highly territorial. The host speculates that their bright colors serve as a warning signal to other creatures to stay away.)

2 **How do prawns and gobies help each other?** (The prawns and the gobies share the same home. The prawns are always shoveling sand, searching for food. The gobies get any extra food the prawns dig up. In return, the gobies watch for predators, as the prawns are almost blind.)

Students will:

- examine the rich array of marine wildlife that lives in waters surrounding the Indian subcontinent
- discuss the interrelationships of organisms in coral reefs

VOCABULARY

You may wish to introduce students to the vocabulary before viewing the program.

coral reef noun: large underwater structure built of the skeletons of thousands of tiny creatures called coral polyps

crustacean noun: mostly aquatic creatures that have hard outer skeletons with jointed legs

ecosystem noun: an interdependent community of animals and plants which create and sustain a specific environment

plankton plural noun: small, floating organisms found in oceans and lakes

FOR FURTHER RESEARCH

For students who want to learn more about this topic, suggest the following:

Breeden, Stanley and Belinda Wright. Through the Tiger's Eyes: A Chronicle of India's Wildlife. Berkeley, Calif.: Ten Speed Press, 1977.

Lieske, Ewald and Robert Myers. Coral Reef Fishes: Caribbean, Indian Ocean, and Pacific Ocean. Princeton, N.J.: Princeton University Press, 1997.

ON THE WEB

Planetary Coral Reef Foundation
http://www.pcrf.org

Coral Health and Monitoring Program
http://coral.aoml.noaa.gov/

International Year of the Ocean (1998)
http://www.yoto98.noaa.gov

Complete the first activity and one other activity of your choice.

AN UNDERWATER RAINFOREST

Coral reefs are found in warm tropical waters near the equator. Reefs are built of the skeletons of thousands of tiny creatures called polyps. Collaborate with your class to create a large mural of a colorful coral reef that might be found in the Indian Ocean. You may use pictures from magazines or books for ideas. Include some of the sea creatures from this program:

• GARDEN EELS • REEF SHARK • STING RAY
• MORAY EELS • SEA FANS • CLOWN FISH

Use resources from your library and the Web to make your reef as authentic-looking as possible, with hiding places, territories, grazers, predators, and so on.

According to some calculations, ten percent of all the world's coral reefs have been destroyed, and thirty percent will all but disappear in the next 20 years. To find out why this is happening, and some ways that you can get involved with protecting coral reefs, contact projects and organizations like SeaWeb (www.seaweb.org) and the Coral Reef Alliance (www.coral.org).

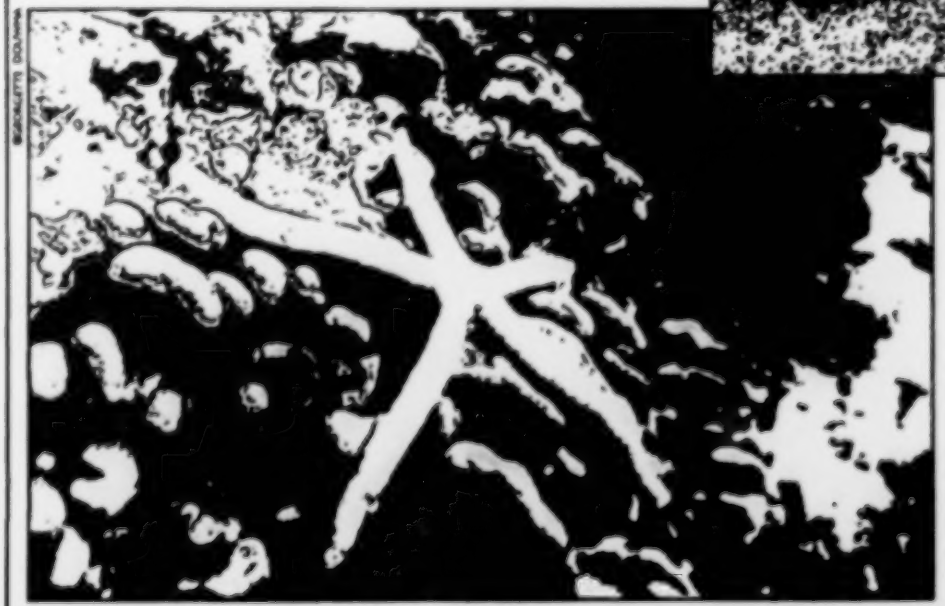
THERE'S NO PLACE LIKE HOME

Valmik Thapar calls it "one of the most extraordinary natural history events in the world." He is talking about when tens of thousands of female olive ridley turtles swim to the east coast of India to lay their eggs on the beach. These mother turtles have not been on this land since they were hatched there, about twenty years before. Many have traveled thousands of miles to get there. Use resources in the library to find out what scientists have learned about these turtles. How, after all those years, can they find the place where they emerged from their shells? What other animals, such as salmon and puffins, also return to their birthplace to breed? Present your findings to your class.

TO THE FAMILY

You are invited to view NATURE. As you watch the program, imagine how your life would be different if you had grown up on an island in the Indian Ocean. After the program, discuss your ideas with your family.

Naturalists are dedicated to identifying and preserving the enormous variety of plants and animals that thrive in the ocean.

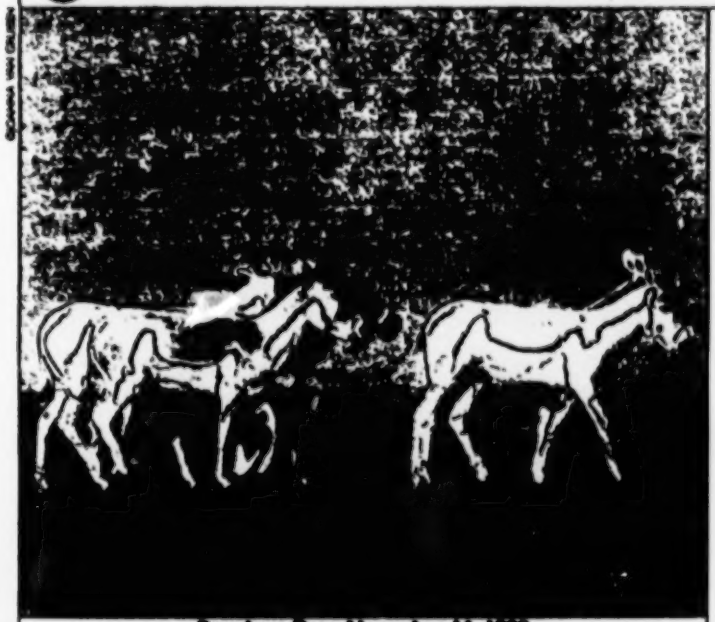


WATER AND WILDLIFE

As this program illustrates, bodies of water can have a profound impact on the people and wildlife that live nearby. Get a map of the region where you live and make note of any bodies of water you see. Using resources from the local library and perhaps your city hall, find out which bodies of water are natural and which are man-made, and which were drained or dredged or filled in. Find out some examples of the types of fish and other creatures that lived in these waters and that live there now. If possible, gather some pictures that show the species that live in your local lakes, rivers, or ocean. Present your research to your class.

These materials were made possible by Park Foundation, Canon U.S.A., Inc., Ford Motor Company, and TIAA-CREF.

4 INDIA: LAND OF THE TIGER/DESERT KINGDOM



Broadcast Date: November 16, 1998

PROGRAM OVERVIEW

Many people think of deserts as barren, lifeless places. But in the Thar Desert in northwest India and eastern Pakistan, a rich variety of wildlife thrives. In addition, the Thar is overflowing with people; it is the most heavily populated desert in the world.

A fascinating array of animals manages to get by with minimal quantities of water. The chinkara (Indian gazelle), for example, survives without drinking water at all. It gets all the moisture it needs from the morning dew and from the leaves of shrubs.

Thapar visits with a tribe of people called the Bishnoi, who are the "true guardians of the desert." They're strict vegetarians, and their culture forbids the killing of any animal. The Bishnoi will take incredible risks to prevent harm to animals. Thapar describes how a young Bishnoi was fatally shot in an effort to protect a chinkara from a poacher's bullet.

The desert is a world of extremes. For seven months, there is not a drop of rain – then suddenly, it is as if the ocean has invaded the land. A monsoon arrives and drenches the desert. During this brief wet period, many animals, such as wild asses, breed.

THEME:* "Desert Kingdom" *illustrates how a harsh climate affects the lives of animals and humans.

BEFORE VIEWING THE PROGRAM

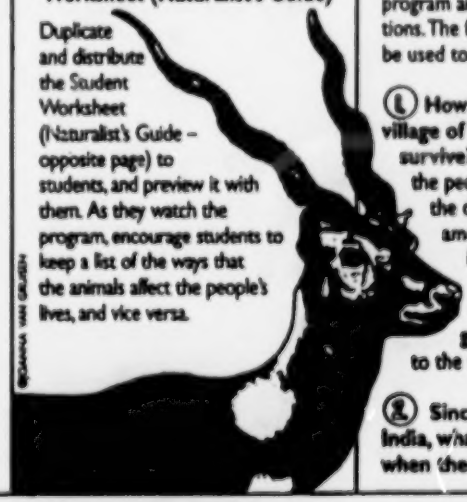
Introducing the Program

Using a map or globe, show students the location of the Thar Desert. Although some people think of deserts as lifeless sand dunes, explain that this program, "Desert Kingdom," will show examples of over 25 different kinds of animals that thrive in the Thar. Ask students to predict what kinds of wildlife might live there. Write all the suggestions on the board.

The temperature in the desert can get oppressively hot. Since Thapar gives all temperatures in Celsius, it helps to know the Fahrenheit equivalent. To convert Celsius to Fahrenheit, multiply by 1.8 and add 32 degrees. At its hottest, the temperature in Thar can reach over 50 degrees Celsius – or over 120 degrees Fahrenheit.

Distribute the Student Worksheet (Naturalist's Guide)

Duplicate and distribute the Student Worksheet (Naturalist's Guide – opposite page) to students, and preview it with them. As they watch the program, encourage students to keep a list of the ways that the animals affect the people's lives, and vice versa.



OBJECTIVES

Students will:

- **examine how some animals have adapted to the arid climate of the Great Indian Desert**
- **study how the lives of people and animals in the Indian deserts have become intertwined**

VOCABULARY

You may wish to introduce students to the vocabulary before viewing the program.

buck noun: a male deer or antelope

conservation noun: the protection and preservation of forests, wildlife, and natural resources

desert noun: often hot, dry, sandy places where very specialized plants grow because there is so little rain and so much evaporation

dung noun: animal droppings

foal noun: a young horse, donkey, or zebra

monsoon noun: strong, seasonal winds, especially in the Indian Ocean and Southeast Asia; a season of heavy rainfall

stallion noun: an adult male horse

waterhole noun: a natural hole or hollow containing water, where animals come to drink when there are no lakes or rivers nearby

SUGGESTED RESOURCES

For students who want to learn more about this topic, suggest the following:

Books

Axworthy, Ann and Anni Axworthy. Anni's India Diary. Danvers, Mass: Whispering Coyote Press, 1992. Written by a 10-year-old girl during her family's trip to India.

Ganeri, Anita. Exploration into India. Parsippany, N.J.: Silver Burdett Press, 1995.

Internet Sites

India: Rajasthan
http://www.incore.com/india/raj.html

Rajasthan Web
http://www.rajasthanweb.com

AFTER VIEWING THE PROGRAM

Encourage students to discuss the program and share their observations. The following questions may be used to spark discussion.

(1) How do the people of the village of Kheechan help cranes survive? (For hundreds of years, the people of Kheechan have fed the demoiselle cranes huge amounts of grain every day. In fact, the cranes fly over a thousand miles from their breeding grounds in Central Asia to the village of Kheechan.)

(2) Since cows are sacred in India, what do the people do when these animals die? How does this affect the vulture population? (Every day, the large dead animals are taken to the edge of the city by a small group of people called the Chamars, who remove their skins. Then vultures descend from the sky and devour the carcass until just the bones are left. Without vultures, the disposal of dead animals in India would be difficult.)

(3) What adaptation enables the climbing perch to survive in the desert? (Over the centuries, the climbing perch became a fish that could survive out of water for more than 24 hours. The climbing perch has lung-like organs in addition to gills. This type of fish can climb out of shallow water, crawl across mud, and seek out a deeper pond to live in.)

Complete the first activity and one other activity of your choice.

LIFE AT THE WATERHOLE

Waterholes help many animals survive in the desert. Around this picture, sketch and write the names of five animals that you might find at a waterhole in India, such as vultures, soft-shell turtles, pied kingfishers, and nilgai (India's largest antelope).

WEEKS WITHOUT RAIN

When it doesn't rain for weeks at a time, even the wettest cities in America can become like deserts – with local wildlife suffering. Research the worst drought your hometown has experienced. How long did your city or town go without rain? In the local library, you may be able to find articles about how your local government handled this crisis. You may also try to interview people who lived in your hometown during this dry spell. Turn your research into a brief news report, and present it to your class.

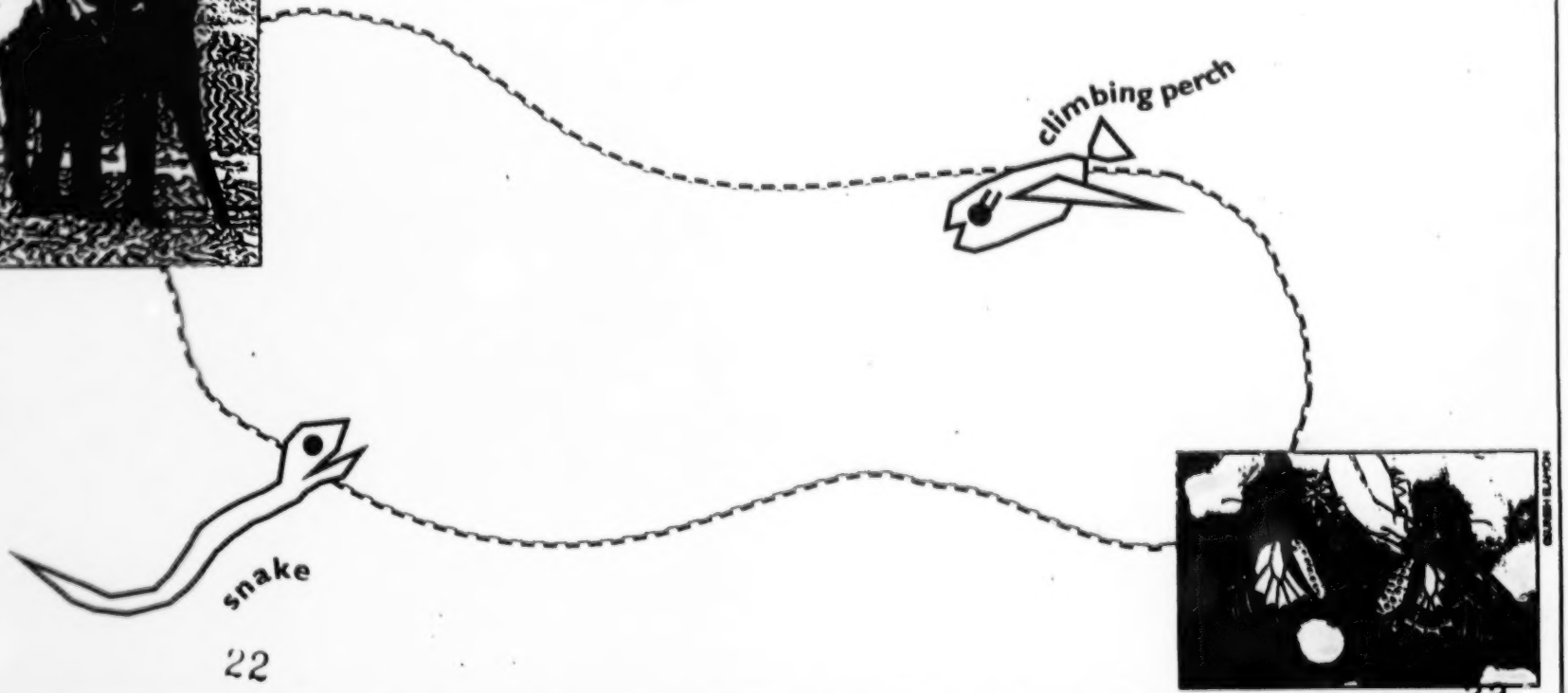
URBAN SCAVENGERS

Vultures eat the remains of dead animals. We call creatures that search for and eat food that has been abandoned by other animals, scavengers. In cities, pigeons sometimes play this role. Although some people dislike these birds, they help keep the garbage level down in our cities. Research and report on Project Pigeon Watch on the Internet at **http://birds.cornell.edu**

TO THE FAMILY

You are invited to view NATURE. As you watch the program, look for examples of the important roles that animals play in the lives of people in Indian subcontinent. After the program, discuss your observations.

Conservationists support the establishment of National Parks to preserve and protect wildlife in its natural habitats.



These materials were made possible by Park Foundation, Canon U.S.A., Inc., Ford Motor Company, and TIAA-CREF.

5 INDIA: LAND OF THE TIGER/MOUNTAINS OF THE GODS

GEORGE HOLTON/PHOTO RESEARCHERS, INC.

Broadcast Date: November 17, 1998

THEME: *In the harsh climate of the Himalayas, animals and people are vital to each other's survival.*

PROGRAM OVERVIEW

In "Mountains of the Gods," Valmik Thapar takes viewers on a journey to the majestic Himalayas, the world's highest mountain range. The Himalayas extend for approximately 1550 miles, and their varied habitats – from snowy peaks to riverbeds to subtropical forests – support a surprising number of unusual creatures.

According to a Hindu legend, the Himalayas were formed when Mother Earth was attacked by a demon and her limbs were thrown towards the sky. Geologists tell a different but equally dramatic story. Millions of years ago, the Himalayas were at the bottom of what is today the Indian Ocean. At that time, India was a large island, drifting north. Eventually, it crashed into Asia with such force that the collision crumpled the earth's crust – and a giant mountain range was born.

Thapar explores the high mountains of Ladakh, home of the snow leopard. Each winter, people in India flock to the numerous monasteries in Ladakh for Buddhist festivals. To Buddhists, all life is linked in an endless cycle of death and rebirth. Their reverence for all living things has made these monasteries a haven for wildlife. In turn, animals are vital to the survival of the people here.

During winter, finding food can be difficult for many animals. The markhor (mountain goats) sometimes climb trees to find sustenance. When the snow melts, scavengers such as vultures devour the remains of carcasses left behind by predators.

Thapar ends this program with a trip to Namobudda, where, legend has it, Buddha gave his life to a starving tigress and her cubs. This legend has been commemorated with a stone sculpture.

BEFORE VIEWING THE PROGRAM

Introducing the Program

Ask students to locate the Himalayas on a globe or map. Tell them that this mountain range is about 1550 miles long. Explain that "Mountains of the Gods" shows how the climate in the snow-capped Himalayas makes it difficult for both people and wild animals to survive. Ask students to discuss what kinds of animals they might expect to find in these cold conditions. Write down all suggestions so students can look at them as they watch the program.

SHONE DOMINIS/MINDEN

Distribute the Student Worksheet (Naturalist's Guide)

Duplicate and distribute the Student Worksheet (Naturalist's Guide – opposite page) to students and preview it with them. As they watch the program, encourage them to look for examples of Buddhist beliefs and legends about animals that live in the Himalayas.

AFTER VIEWING THE PROGRAM

Encourage students to discuss the program and share their observations. The following questions may be used to spark discussion.

(L) For Hindus, the Gaumukh River – the Ganges' source in the mountains – is among the holiest places in the Himalayas. In what ways do the holy men known as sadhu believe this glacial river can help them? (The Himalayas are thought of as the Mountains of the Gods. By bathing in the sacred waters of the Gaumukh, sadhu believe they can cleanse their souls.)

(L) As red pandas move through the forest, they mark their trails with a scent. Why do they do this? Why else might an animal mark its territory? (By marking their trails, the red pandas – normally solitary creatures – can find one another during mating season. Another reason an animal marks its territory is to warn other members of the same species to "keep out.")

OBJECTIVES

Students will:

- observe how the Himalayan mountain range supports a rich variety of animal life
- compare and contrast geological and mythological explanations for how the Himalayas were formed

VOCABULARY

You may wish to introduce students to the vocabulary before viewing the program.

carrion noun: dead, decaying animal flesh; often eaten by scavengers

mantra noun: a sacred word or sound that is repeated as an mystical chant in the Hindu and Buddhist faiths

meltwater noun: water melted from snow or ice

monastery noun: a group of buildings where monks live and work in seclusion and contemplation of their religious vows

plateau noun: an area of high, flat land

scavenger noun: an animal that searches for and eats food that has been abandoned by others

ADDITIONAL RESOURCES

For students who want to learn more about this topic, suggest the following:

Books

Roos, Stewart. Demons and Dragons: Myths of China, Japan and India. Providence, R.I.: Copper Beech Books, 1998.

Sattler, Helen Roney and Giulio Maestro. Our Patchwork Planet: The Story of Plate Tectonics. New York: Lothrop Lee & Shepard, 1995.

Internet Sites

Destination Himalayas: Where Earth Meets Sky
http://library.advanced.org/10131/javascriptmenu_final.html

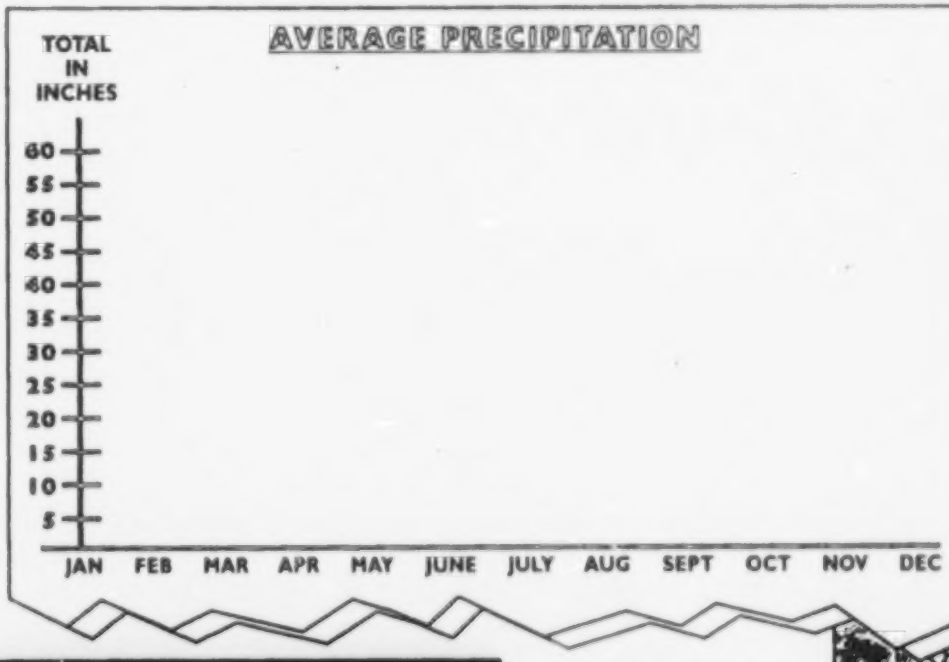
Sagarmatha National Park
http://firewall.unesco.org/whc/sites/120.htm

Complete the first activity and one other activity of your choice.

HARD RAIN'S GOING TO FALL

India receives most of its annual rainfall during the monsoon season (between June and September). In some parts of northeastern India, more than 120 inches of rain falls during the year – and some areas get an average of 450 inches of rain! Use the library or the Internet to research the average precipitation in your home state. Make a graph showing the average precipitation for each month, add up the total, and compare it with the annual rainfall in northeastern India.

AVERAGE PRECIPITATION



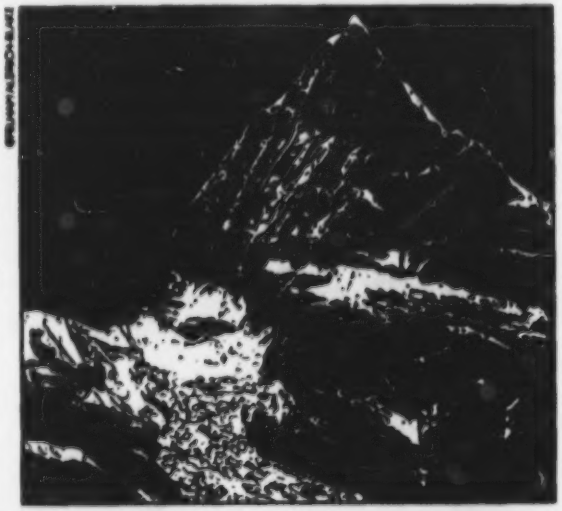
TO THE FAMILY

You are invited to view NATURE. As you watch the program, look for examples of why the Himalayas are sometimes called "a frozen desert." In addition, look for some ways that animals and people help each other survive in this harsh climate.

A geologist studies the earth to develop theories about the planet's evolution.

A RANGE IS BORN

There are two amazing stories of how the Himalayas were created – the legend of Vishnu and Mother Earth and the geological Theory of Continental Drift. Work with another student to research these two stories. The legend comes from an epic called the Mahabharata; the drift theory was developed by Alfred Wegener in 1912. Then collaborate on a two-part book that tells how the Himalayas were formed. When read one way, the book presents the legend. When flipped and read the other way, the book presents the geological explanation. Create illustrations for your book, and share it with the class.



DROP IN FOR DINNER

The scarcity of food in the Himalayas encourages animals to be resourceful in getting their meals. The bearded vulture, for example, drops animal bones onto rocks to crack them open, so they can eat the marrow inside. Use the library or the Internet to find other birds, such as herring gulls, that use hard rocks and gravity to get at their meals. Do you think this behavior is instinct or learned? Work with another student to figure out how you might explore the answer to this question.

These materials were made possible by Park Foundation, Canon U.S.A., Inc., Ford Motor Company, and TIAA-CREF.

6 INDIA: LAND OF THE TIGER/MONSOON FORESTS

Broadcast Date: November 17, 1998

PROGRAM OVERVIEW

In this final program in the series, Valmik Thapar takes the viewer on a journey through the misty, green rainforests of the Indian subcontinent. Thapar seeks out some of the rarest animals in the world, such as the lion-tail macaque. Since these macaques can't digest leaves, they must stay in the forest, where fruit, seeds, and insects are widely available year round.

Some animals are on the Indian subcontinent as a result of a collision of the tectonic plates beneath Southeast Asia and what is now India. In other words, a few species native to Asia migrated to India, including the gibbon, the cobra, and the flying frog.

Thapar marvels at how the people who live in the monsoon forest climb tall trees to get honey from a wild bees' nest. This ancient skill is handed down from father to son, from one generation to the next.

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Figs play an essential role in the monsoon forests. Many creatures depend on them for survival, including the great pied hornbills, the Malabar gray hornbills, and the Nilgiri langurs. By eating figs, the hornbills help scatter the fig seeds far and wide. Wasps also aid fig pollination.

Thapar visits the largest banyan tree in the world, so vast it could cover five soccer fields. This tree is so holy that if a person accidentally picks up a leaf from it, he or she must return it or risk the fury of the gods. Thapar then travels to Sri Lanka, an island off the southern coast of India. Sri Lanka has more unique species than anywhere else in the subcontinent.

Half a billion people in India worship Ganesh, the elephant god. However, elephants in India epitomize the paradoxes of human relationships with the wild. Although elephants can destroy crops or pose other dangers, they are rarely killed. Instead, some are trained and cared for by mahouts, who even prepare special food for the elephants.

THEME: ***"Monsoon Forests" illustrates how a moist climate can create great biodiversity and foster remarkable interactions between plants, animals, and humans.***

BEFORE VIEWING THE PROGRAM

Introducing the Program

Show a map of the Indian subcontinent, and explain that an enormous area was once entirely "wet forests." This "green pathway" made it possible for animals to travel great distances on land. Due to changes in climate and human activities such as cutting down forests for cropland, monsoon forests are now restricted primarily to three areas: Sri Lanka, the Western Ghats, and Northeast India.

Ask students to use what they know about rainforests to make predictions about the kinds of animals that might live there. If time and resources permit, you could supplement this opening activity by gathering books with pictures of 20 different animals. Ask students to predict whether they'd expect to find each animal in the monsoon forests of India.

Distribute the Student Worksheet (Naturalist's Guide)

Duplicate and distribute the Student Worksheet (Naturalist's Guide – opposite page) to students and preview it with them. As they watch the program, encourage students to observe how humans interact with animals in India, and to contrast this to such interactions in the U.S.

Students will:

- discuss the complex coexistence of humans and wild animals in the rain forests of the Indian subcontinent
- observe the enormous influence a single plant – the fig tree, for example – can have on the survival of a variety of creatures

You may wish to introduce students to the vocabulary before viewing the program.

camouflage noun: coloring that allows animals to blend in with their surroundings

mahout noun: person in India who domesticates and trains wild elephants

monsoon noun: strong, seasonal winds, especially in the Indian Ocean and Southeast Asia; a season of very heavy rainfall

rut noun: an annual period of sexual excitement and reproductive activity

For students who want to learn more about this topic, suggest the following:

Rain Forests is one of a series of books from the Habitat Ecology Learning Program (HELP) of the Wildlife Conservation Society. For more information, contact the Manager of National Programs at:

Education Department
Bronx Zoo/Wildlife Conservation Park
2300 Southern Boulevard
Bronx, NY 10460
(800) 937-5131

American Museum of Natural History's site on "Biodiversity"
http://www.amnh.org/exhibitions/biodiversity/index.html

Year for the Tiger: The Science of Tiger Conservation
http://www.worldwildlife.org/tiger/conservation.shtml

AFTER VIEWING THE PROGRAM

Encourage students to discuss the program and share their observations. The following questions may be used to spark discussion.

1. **Many animals in the wet forests depend on the fig tree for their diet. But, the host says, "Figs need hornbills just as much as hornbills need figs." How do the hornbills help the fig tree?** (Hornbills eat the figs. Seeds from hornbill droppings are buried in the soil, where they grow.)

2. **How do the people who live in the forest gather honey from wild bees' hives?** (A honey gatherer sticks wooden pegs into the trees to create natural ladders. Then he climbs up the tree to the bees' nest and places burning leaves beside it. The smoke from the leaves stuns the bees, so he can take some honey and part of the honeycomb. Incidentally, honeybees in the U.S. don't sting when there's smoke blown all around.)

3. **Why are there so many brightly colored animals in the monsoon forest?** (Bright colors serve a number of important functions. They can work as camouflage to blend in with the forest. They also signal other animals to stay away. A quick flash of color can startle and scare another animal for a moment. Some animals' bright colors fool other animals into thinking they are a more dangerous species. The non-venomous milk snake, for example, has red, yellow, and black bands, which mimic the poisonous coral snake.)

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LONG-LOST COUSINS

This program features an animal called a lion-tail macaque. Although this monkey is not related to the lion, it gets it name because of its lion-like tail and mane. Using library resources, look up these eight animals and find out how they got their nicknames:

- ☐ ANT LION
- ☐ RHINOCEROS BEETLE
- ☐ ELEPHANT SHREW
- ☐ KANGAROO RAT
- ☐ TIGER BEETLE
- ☐ MONKEY FLOWER
- ☐ TIGER MOTH
- ☐ TIGER LILY

RHINOCEROS BEETLE

Complete two activities.

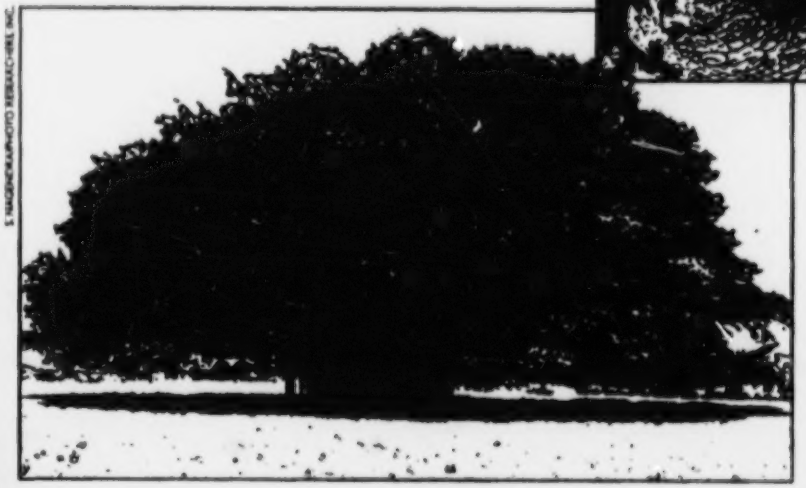
INSECT HUNTER

Although the chameleon walks slowly and deliberately, it is quite adept at catching insects with its sticky tongue. Create a flip-book to animate how a chameleon catches its meals. If you have access to a videotape of "Monsoon Forests", you could watch the chameleon section in slow-motion to get all the details. If you don't have a videotape, you could gather information from the library.

TO THE FAMILY

You are invited to view **NATURE.** As you watch the program, compare the families in the monsoon forests with your own. How would your life be different if you lived in an Indian "wet forest"? After the program, share your thoughts with your family.

A biologist sometimes examines how different species are affected by extreme temperatures in the environment.



GO FIG-URE!

Valmik Thapar says "figs are truly the linchpins of the forest," as they offer food and shelter to many people and animals. Using the library or the Internet, make a list of some of the ways that figs are used in different societies around the world. As an alternative activity, you could research the uses and cultural importance of a crop like corn or yams. Work with another student to prepare a presentation on figs or some other meaningful food for your class. As a finale, you may wish to give everyone a taste of a dish you prepared.

RAINIEST PLACE IN AMERICA

The hill forests of southern India receive rain for six months of the year. Use the library or the Internet to research which town or city in the U.S. had the most rain last year. Which town or city had the least rain? Compare the types of wildlife that live in these areas, and how they survived in the extreme weather conditions. Create a short newsletter for your class to share what you've learned.

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SEASON 17 NATURE SCHEDULE

October 1998-June 1999
(check local listings)

Great White Bear	October 11
The Secret World of Sharks and Rays	October 18
Animal Attractions: San Diego Zoo	October 25
American Buffalo: Spirit of a Nation	November 1
Toothwalkers: Giants of the Arctic Ice	November 8
India: Land of the Tiger	
The Tiger's Domain	November 15
Sacred Waters	November 15
Unknown Seas	November 16
Desert Kingdom	November 16
Mountains of the Gods	November 17
Monsoon Forests	November 17
The Elephants of Africa	November 22
Bower Bird Blues	November 29
John Denver: Let This Be a Voice	December 6
Orangutans: Just Hangin' On	December 13
Sperm Whales: The Real Moby Dick	December 20
Life at the Edge of the Sea	December 27
The Joy of Pigs	January 3
Serengeti Stories (working title)	January 10
Secret Garden	January 17
Gremlins: Faces in the Forest	January 24
Born to Run	January 31
Iceland: Fire and Ice (working title)	February 7
Walking with Giants: Siberia Grizzlies	February 14
Extraordinary Cats	February 21
Parrots: Look Who's Talking	February 28
Conversations with Koko	March 7
Extraordinary Dogs	March 14
The World of Penguins	March 21
The Wild Side of New York	March 28
Grand Canyon	April 4
Alien Empire	
Hardware/Replicators	April 11
Battlezone/Metropolis	April 18
Voyagers/War of the Worlds	April 25
Wolves and Buffalo: The Last Frontier	May 2
Jane Goodall's Wild Chimpanzees	May 9
The Secret World of Sharks and Rays	May 16
The Seedy Side of Plants	May 23
Eagles	May 30
Yellowstone Otters	June 6
A Lemur's Tale	June 13
Mask of the Mandrill	June 20
The Elephant Men	June 27

NATURE continues throughout the summer. Check local listings.

VIDEO ORDERING INFORMATION

For information on "INDIA: LAND OF THE TIGER," call 212-560-3000.

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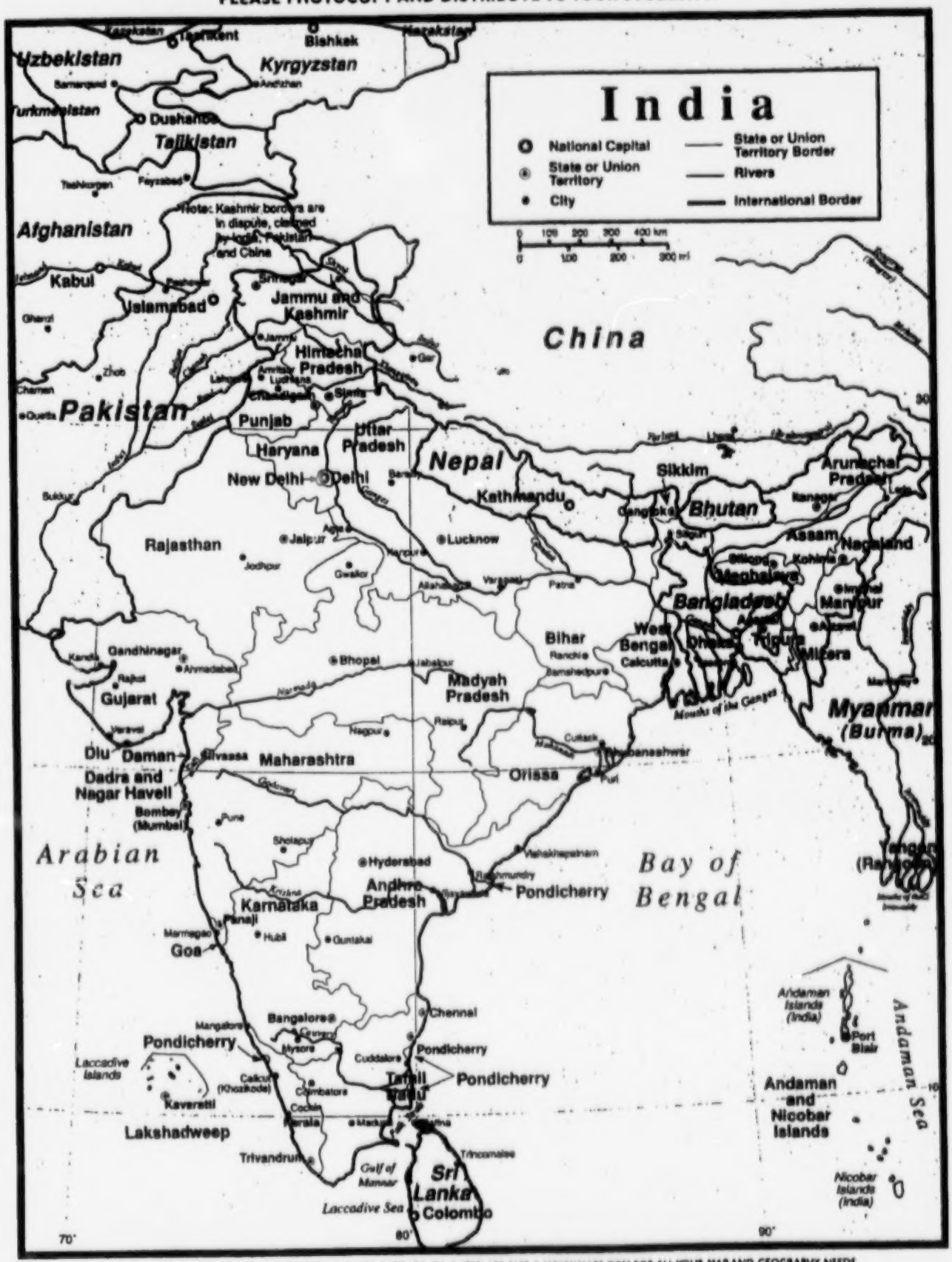

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